**PROCEDURES TO TAKE DURING AN ALARM**

⚠ **WARNING—THE ACTIVATION OF THIS DETECTOR INDICATES THE PRESENCE OF DANGEROUS LEVELS OF GASOLINE OR PROPANE VAPORS THAT COULD CAUSE AN EXPLOSION OR FIRE. TAKE THESE STEPS:**

1) **Turn off all electrical equipment, generators; extinguish open flames (oven, cook top, smoking materials etc.).**
2) **Turn off the engine(s) if safe navigation conditions exist.**
3) **Open the engine compartment, ports, hatches and doors and ventilate the area.**
4) **If you are at shore, evacuate the boat. Do not return until the area is ventilated and the detector has returned to normal standby condition.**
5) **Proceed with caution and locate and repair the cause of the leak. Seek a qualified technician if necessary.**
6) **Do not start or use the boat until the necessary repairs were made.**

## SPECIFICATIONS

Power Supply - 12 VDC  Operational Voltage - 7 to 15 VDC  Power Draw -.200 amps @ 14 VDC

Operating Temp -22$^0$ F - 160$^0$ F  Alarm Threshold - <20% LEL of Gasoline and Propane

Other gases detected but not listed; Alcohol, Acetone, Hydrogen and most other flammable gases

Marine UL listed to Standard UL 1110

## LIMITED PRODUCTS WARRANTY

**MTI INDUSTRIES, INC**. warrants to the original retail purchaser that its products will be free from defects of material or workmanship for a period of One (1) year from the date of retail purchase. If proven to have been defective in original materials or workmanship and returned, delivery costs prepaid, MTI INDUSTRIES, INC. will replace this product free of charge.

## LIMITS OF WARRANTY

Replacement is your exclusive remedy under this limited warranty or any other warranty (including any implied warranty of merchantability for a particular purpose). Any and all implied warranties or merchantability or fitness for a particular purpose shall be limited to the warranty period from the original date of retail purchase. MTI INDUSTRIES, INC., its dealers and distributors shall in no case be responsible or in any way liable for any incidental or consequential damages for any reason. Some states do not allow the limitation or exclusion of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific rights, and you may also have other rights, which may vary, from state to state.

## PRODUCT NOT WARRANTED

**NOTE- <u>There are no user serviceable parts inside the case. Opening any SAFE-T-ALERT™ product for any reason voids the warranty.</u>** This warranty does not cover damage or failure resulting from acts of God, abuse, misuse, neglect, or faulty installation.

## WARRANTY RETURN PROCEDURES

It is MTI's experience that an alarm is sounding for a reason. Call, ask your dealer to call, or e-mail our Customer Service Department (as listed below) to trouble shoot the situation.

Customer Service Phone No. - 800-383-0269  Fax No. 847-546-9007

E-mail Service@mtiindustries.com  Web Site: www.mtiindustries.com

If Customer Service determines that the unit is defective, a Replacement Authorization (RA) number will be issued. **No product will be accepted for service or replacement without first obtaining a RA number.**

UL LISTED

©2004 MTI Industries, Inc. **ALL RIGHTS RESERVED**

MTI FORM NO: SA1-1004 Rev-1

# MARINE TECHNOLOGIES, INC.

## SAFE-T-ALERT™ SA-1 and SA-1XL

## MARINE GASOLINE AND PROPANE DETECTOR USER'S MANUAL

**IMPORTANT**

**PLEASE READ CAREFULLY AND SAVE**

**ATTENTION: This user's manual contains important fume detector installation, operation, troubleshooting and warranty information. Read, follow, and keep this manual for future reference.**

**NOTE: If you install or purchase this alarm for another person, give this manual to that person.**

⚠ **WARNING**

## WHY EVERY BOAT NEEDS A FUME DETECTOR

Every year, boating injuries and deaths can be attributed to explosions that could have been avoided. Even fumes from a half-cup of gasoline have the explosive force of six sticks of dynamite. With a boat's gas-powered engine or gas/LP gas powered appliances, vapors can easily develop in pumps, tanks, lines, or carburetors.

The **SAFE-T-ALERT™** SA-1 and SA-1XL system is exclusively designed, tested and listed by the Underwriters Laboratories for use in the harsh marine environment. The unit serves as an early warning detector to protect you and your boat from propane and gas fumes. The SA-1 and SA-1XL provide sensors to detect the build up of explosive gases even in early stages. The sensors alarm when 20% or less of the lower explosive limit of gasoline or propane vapors is present in a monitored area.

⚠ **WARNING**

## LIMITATIONS OF FUME DETECTORS

**This detector will not work without power**. Some reasons your detector may not have power include an open circuit breaker, a blown or missing fuse, a broken wire or improper wire crimp connection.

**Detectors may not be heard.** The detector's loudness is designed to meet or exceed regulatory standards; however, the detector may not be heard if they are remotely located. Individuals who are hard-of-hearing, have consumed alcoholic beverages, have taken prescription, non-prescription or illegal drugs may not hear the alarm. If your boat has any sleeping areas, consider installing additional detectors in those areas.

**This detector will only indicate the presence of fumes at the sensor.** The sensor cannot monitor a compartment that is separated by a bulkhead. Gasoline fumes may be present in other areas. MTI recommends that sensors be installed in **ALL** compartments containing fuel tanks and or engine(s) and compartments where gasoline or propane fumes may accumulate.

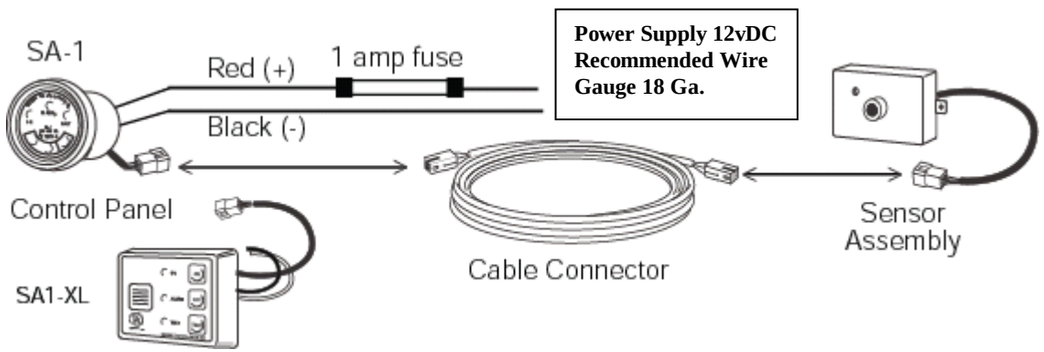
## INSTALLATION INSTRUCTIONS

**Assemble the following supplies:** An 3/8" electric drill, ¼" and 7/64" drill bits, 2-1/8" hole saw, electric jigsaw, screwdrivers (Phillips and slotted), stainless-steel pan head screws, washers bolts, nuts, locking nuts, silicone sealant, 18-, 14-gauge wire, inline fuse holder, 1A fuse, wire stripper, crimping tool, crimp connectors, adhesive-lined heat shrink tubing, split loom wire wrap, heat gun, wire supports, and cable ties.

**When you have the supplies on hand, take the following steps:**

1. Locate the control panel at the helm where it can be easily seen and heard. Check first to be sure that there is at least 3 inches of clearance behind the location to allow for mounting and wiring. Drill a 2 1/8 inch hole and mount the control panel. Use a marine-grade silicone sealer if the unit is exposed to the weather. **DO NOT CONNECT POWER UNTIL THE INSTALLATION IS COMPLETE.**
2. Connect the cable assembly to the control panel and run it to the engine compartment. Secure the run every 18 inches with plastic wire supports.
3. Locate the sensor in a dry area on a forward bulkhead in the engine compartment. The sensor should be at the same height as the starter motor. Orient the sensor so that the 4-wire cable is facing down. This will prevent any water or condensed water vapor from entering the unit. Connect the cable assembly from the control panel to the sensor.
4. Connect a 1A inline fuse holder to the red (+) lead of the control panel. Run a length of red (+) 18-gauge wire to the positive terminal on the 12V main battery. Run a length of 18-gauge yellow or black (-) wire to the negative terminal on the 12V battery. Use ring-type insulated crimped connectors at the battery end of the run. Secure the run every 18 inches with plastic wire supports. As added protection, use adhesive-lined shrink tubing on all crimped connections.
5. Upon installation completion, run a system check of both the sensor and the control panel. Be sure to turn the unit off when leaving the boat, as constant monitoring will run down the 12V battery.

Your assembled system should look similar to the following.




**ADDITIONAL INSTALLATION TIPS**

- DO NOT mount the control panel under a cowling, or a glass or plastic panel where it my not be seen or heard.
- DO NOT locate the sensor above batteries. Hydrogen from the batteries may cause false alarms.
- DO NOT locate the sensor behind an obstruction that will prevent air flow to the sensor.
- DO NOT locate the sensor on the aft bulkhead. Water on the sensor will cause permanent damage to the sensor and sensor assembly.
- DO NOT locate the sensor within 12 inches of exhaust lines. High heat may cause false alarms.

**OPERATION**

The SA-1 and SA-1XL units have supervisory circuits to warn of a missing sensor, sensor assembly malfunction, disconnected or a broken connector cable.

1. Press the ON pad on the control panel. The WAIT (YELLOW) light should turn on. Press the TEST pad to check the operation of the alarm sounder and alarm light. In about two minutes the WAIT (YELLOW) light will turn off and the ON (GREEN) light will turn on. The detector is now operational and monitoring for gas and propane fumes.

2. When the sensor detects gasoline or propane fumes above the alarm threshold levels, the alarm will sound and the ALARM (RED) light will turn on. The alarm will continue until the air in the monitored area returns to safe levels. **See the section on PROCEDURES TO TAKE DURING AN ALARM.**

**TESTING**

**⚠ WARNING: TEST THIS ALARM'S OPERATION AFTER THE BOAT HAS BEEN IN STORAGE, BEFORE EACH TRIP, AND AT LEAST ONCE PER WEEK DURING USE.**

1. With the unit on, check the sensor assembly light. The RED light should be on.
2. When the ON (GREEN) operation light is lit, the sensor assembly can be tested.

**⚠ WARNING: USE ONLY BUTANE LIGHTER TO PERFORM THIS TEST. NEVER USE GAS SOAKED MATERIAL.**

3. SENSOR TEST: Direct the lighter towards the sensor and depress the lever to release gas (only) into the sensor. The alarm should sound and the ALARM (RED) light on the control panel should be lit.
4. SUPERVISORY CIRCUIT TEST 1: Disconnect one end of the 20-foot connector cable. The alarm should sound and the ALARM (RED) light on the control panel should be lit.
5. SUPERVISORY CIRCUIT TEST 2: Use a rocking motion to pull the sensor (Figaro TGS 813) straight out from the sensor assembly. The alarm should sound and the ALARM (RED) light on the control panel should be lit.

**IF THE UNIT DID NOT TEST PROPERLY, SEE THE TROUBLE SHOOTING GUIDE**

**⚠ WARNING: NEVER ENTER THE ENGINE COMPARTMENT WITH OPEN FLAME OR LIT SMOKING MATERIALS. THEY CAN CAUSE EXPLOSION AND/OR FIRE.**

**MAINTENANCE**

1. Keep the sensor free of dust and debris. It is recommended that the sensor—the Figaro TGS 813—(MTI Part No. SA-186-S) be replaced annually due to the contamination caused in the marine environment. To replace, pull sensor straight out from base.
2. Remove the sensor whenever the bilge compartment or engine compartment equipment is being cleaned, painted, power washed etc. Direct contact with chemicals, WD-40, water, oil, etc. can cause permanent damage to the sensor.

**TROUBLE SHOOTING GUIDE**

| Problem | Cause |
|---|---|
| No Power | Wire connections, missing or blown fuse, reversed wires, or defective unit. |
| Locked In Wait | Replace sensor assembly SA-186-SB. |
| Immediate Alarm Turned On | Cable disconnected or broken, Sensor assembly, Check sensor assembly red light. |
| No Audible Alarm | Return for repair or replacement. |
| No Alarm During Supervision Tests | Return for repair or replacement. |
| Red LED ON Sensor Assembly Is Off | Unit is off, Cable disconnected or broken, SA-186-SB defective. |
| No Alarm when Sensor is Removed | If panel tests OK, replace the sensor Figaro TGS 813. |
| No Alarm With Lighter Test | If the panel tests OK, replace the Figaro TGS 813 sensor. If that does not remedy the condition, replace the sensor assembly SA-186-SB. |

**NOTE:** To order the Figaro TGS 813 sensor, specify MTI part number SA-186-S.